[예제 4-1] ex04-01.c

```
#include <unistd.h>
#include <fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <stdio.h>

int main()
{
    char *originalname = "test.txt";
    char *hardfilename = "test.txt.hard";
    char *softfilename = "test.txt.soft";

    int filedes, retval;
    mode_t oldmask;
    char buffer[1024];
    int  nread;
    struct stat finfo;

    oldmask = umask(0377);

    filedes = open(originalname, O_CREAT, 0755);
    close(filedes);

    if(retval = access(originalname, W_OK) == -1)
    {
        printf("%s is not writable\n", originalname);
        chmod(originalname, 0644);
    }

    link(originalname, hardfilename);
    symlink(originalname, softfilename);

    rename(hardfilename, "newname.txt");

    nread = readlink(softfilename, buffer, 1024);
    write(1, buffer, nread);

    stat(originalname, &finfo);
```

```
    printf("\n%s\n", originalname);
    printf("File mode    : %o\n", finfo.st_mode);
    printf("Files size   : %d\n", finfo.st_size);
    printf("Num of blocks   : %d\n", finfo.st_blocks);
}
```

[예제 4-2] ex04-02.c

```
#include <unistd.h>
#include <sys/types.h>
#include <sys/stat.h>

int main()
{
    int filedes;
    mode_t oldmask;

    oldmask = umask(023);
    filedes = open("test.txt", O_CREAT, 0777);
    close(filedes);
}
```

**[예제 4-3] ex04-03.c**

```
int main()
{
    int filedes;

    filedes = open("test.txt", O_RDWR);

    printf("%d \n", filedes);

    close(filedes);
}
```

**[예제 4-4] ex04-04.c**

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int main()
{
    char *filename = "test.txt";

    if ( access(filename, R_OK) == -1 )
    {
        fprintf( stderr, "User cannot read file %s \n", filename);
        exit(1);
    }
    printf("%s readable, proceeding \n", filename);

    /* rest of program ... */
}
```

[예제 4-5] ex04-05.c

```
#include <sys/types.h>
#include <sys/stat.h>

int main()
{
    mode_t mode1, mode2;
    mode1 = S_IRUSR | S_IWUSR | S_IRGRP | S_IROTH;
    mode2 = 0644;

    if(chmod("test1.txt", mode1) == -1)
        exit(1);
    if(chmode(test2.txt", mode2) == -1)
        exit(1);

    printf("rest of program ... \n");
}
```

**[예제 4-6] ex04-06.c**

```
#include <sys/types.h>
#include <unistd.h>

int main()
{
    if(chown("test.txt", 2045, 200) == -1)
        exit(1);
    printf("rest of program ...\n");
}
```

**[예제 4-7] ex04-07.c**

```
#include <unistd.h>

int main(int argc, char *argv[])
{
        if(link(argv[1], argv[2]))
                printf("hard-link failed\n");
}
```

**[예제 4-8] ex04-08.c**

```
#include <unistd.h>

main(int argc, char *argv[])
{
        if(symlink(argv[1], argv[2]))
                printf("soft-link failed\n");
}
```

**[예제 4-9] ex04-9.c**

```
#include <stdio.h>
#include <unistd.h>

int main()
{
        char buffer[1024];
        int nread
        nread = readlink("test.txt", buffer, 1024);
        write(1, buffer, nread);
}
```

**[예제 4-10] ex04-10.c**

```
#include <stdio.h>

int main(int argc, char *argv[])
{
    if(argc != 3)
        exit(1);
    if(rename(argv[1], argv[2]) == 0)
        printf("성공!\n");
    else
        printf("실패!\n");
}
```

[예제 4-11] ex04-11.c

```
#include <stdio.h>
#include <string.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(int argc, char *argv[])
{
    struct stat finfo
    char fname[1024];

    if(argc > 1)
        strcpy(fname, argv[1]);
    else
        strcpy(fname, argv[0]);

    if(stat(fname, &finfo) == -1) {
        fprintf(stderr, "Couldn't stat %s \n", fname);
        exit(1);
    }
    printf("%s \n", fname);
    printf("ID of device: %d \n", finfo.st_dev);
    printf("Inode number: %d \n", finfo.st_ino);
    printf("File mode   : %o \n", finfo.st_mode);
    printf("Num of links: %d \n", finfo.st_nlink);
    printf("User ID     : %d \n", finfo.st_uid);
    printf("Group ID    : %d \n", finfo.st_gid);
    printf("Files size  : %d \n", finfo.st_size);
    printf("Last access time : %u \n", finfo.st_atim);
    printf("Last modify time : %u \n", finfo.st_mtim);
    printf("Last stat change : %u \n", finfo.st_ctim);
    printf("I/O Block size : %d \n", finfo.st_blksize);
    printf("Num of blocks  : %d \n", finfo.st_blocks);
    printf("File system : %s \n", finfo.st_fstype);
}
```